

# **Stormwater Design Standards Manual Educational Workshop #1:**

## **Submittal, Permitting and Closeout Process & Conceptual Planning for Stormwater and Low Impact Development**

**28 May 2020**

# Agenda

- General Manual Information
- Specific Workshop Information
- General Public Q&A
- Technical Information
  - City Stormwater Permitting Submittal, Permitting and Closeout Process
  - Conceptual Planning for Low Impact Development and Stormwater
- Technical Q&A

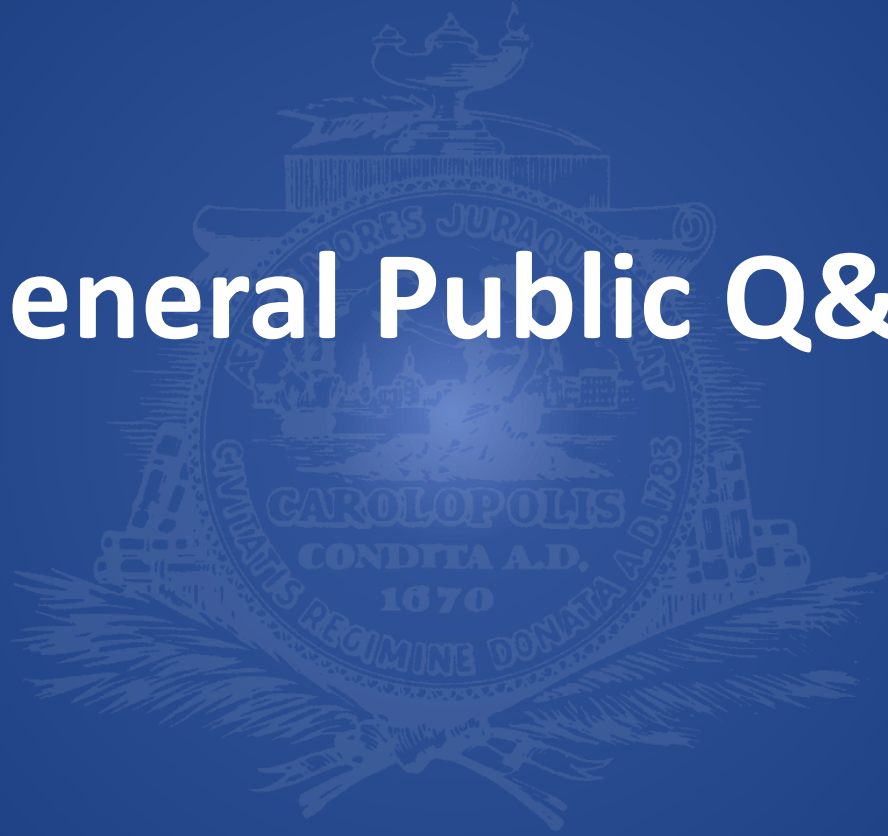
# General Manual Information

- Stormwater Design Standards Manual (SWDSM) is a federally mandated requirement of the National Pollution Discharge Elimination System (NPDES) Phase II Stormwater Program
- SWDSM is used by design community to develop designs and used by the City to review, approving, and permitting designs.
- SWDSM has 8 chapters:
  1. Introduction and Legal Authority
  2. Conceptual Overview
  3. Design Requirements
  4. Construction Activity Permitting
  5. Construction Phase
  6. Post-Construction
  7. City Inspection and Enforcement
  8. References
- Originally passed in 2007, first update was completed in 2013
- Newest update goes into effect ***July 1, 2020***

## Specific Workshop Information

- Permitting Process
  - National Pollution Discharge Elimination System (NPDES)
  - City of Charleston Technical Review Committee (TRC)
  - Citizen Access Portal (CAP)
  - Submittal, Review, Revision/Resubmittal, Approval
- Construction Activities
- Post-Construction
- Conceptual Planning for Stormwater and Low Impact Development (LID)

# General Public Q&A



# City Process

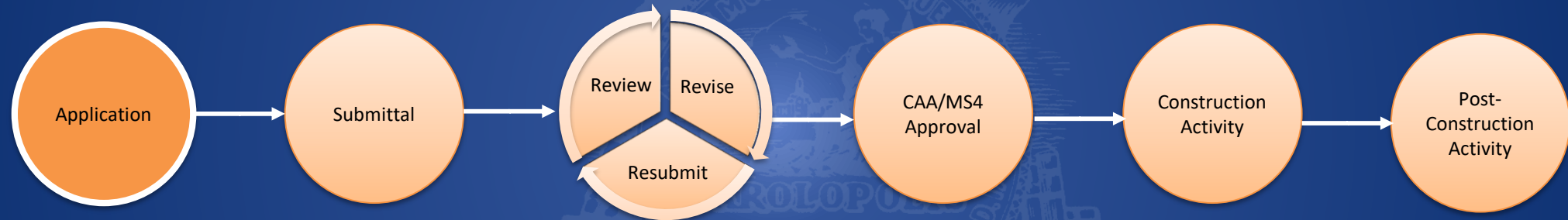
## *Educational Memorandum #1*

- Permitting Process
  - TRC versus non-TRC Submittals
  - Submittal
  - Technical Review Committee Application
  - Construction Activity Application
  - Exemptions and Design Exceptions
  - Fees
  - Citizen Access Portal
  - City Review
  - Revision/Resubmittal
  - Approval
- Construction Activity
  - Pre-Construction
  - Construction
  - Notifications
- Post-Construction Activity
- Warranty

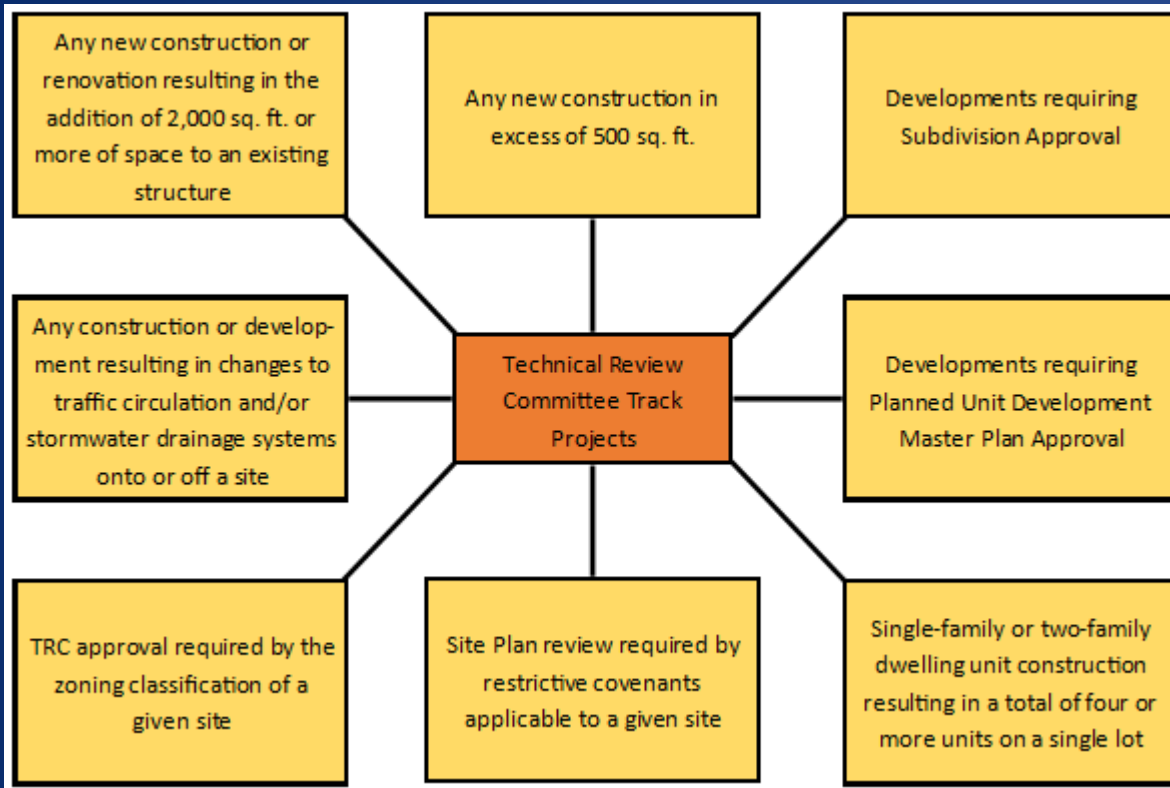


# City Process

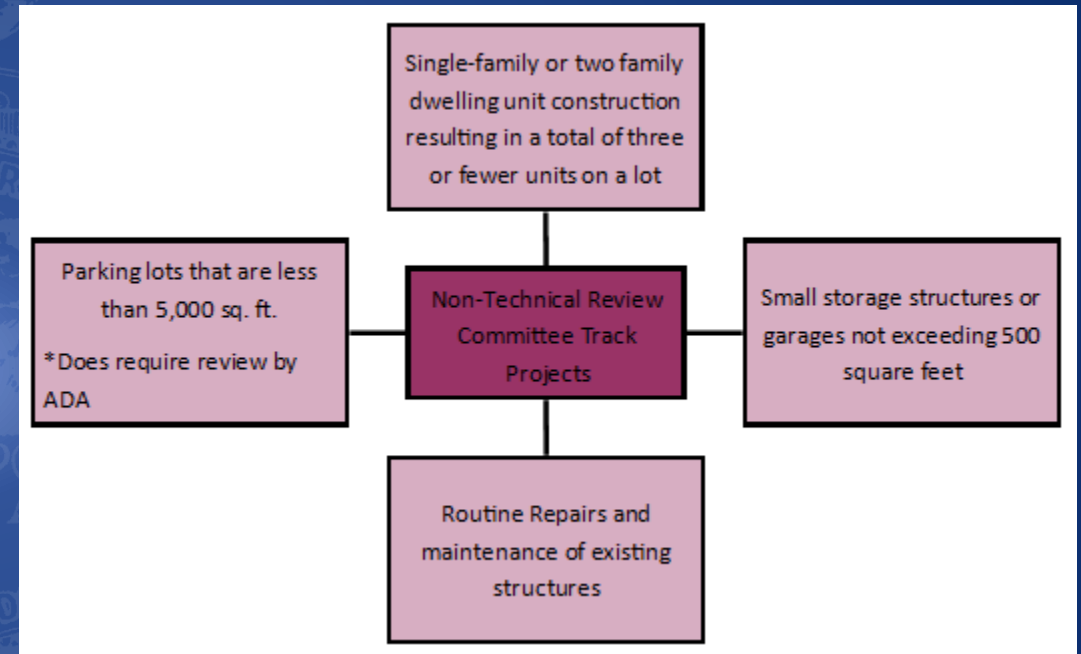
*Educational Memorandum #1*



# Permitting Process: Application – City Review Tracks



Submitted to the Zoning Division



Submitted to the Department of Stormwater Management

# Permitting Process: Application - TRC

- TRC categorizes projects as *Site Plan* or *Subdivision*
  - Site Plan Application: <https://www.charleston-sc.gov/DocumentCenter/View/20150/TRC-Site-Plan-Application-January-2019?bidId=>
  - Subdivision Application: <https://www.charleston-sc.gov/DocumentCenter/View/17219/TRC-Subdivision-Application---TRC--PC-June-2019?bidId=>
- TRC Manual: <https://www.charleston-sc.gov/DocumentCenter/View/17190/TRC-Manual-Revised-December-2017?bidId=>

\*Please note that the TRC Manual was last updated in 2017 – any Stormwater Chapter References are for the 2013 SWDSM not the 2020 SWDSM

# Permitting Process: Complete Construction Activity Applications

## *Single Family Residential*

- Complete Building Permit Application
- EPSC Certification Form

## *Small Construction Activity (Type I)*

- Type I Application Form
- EPSC Certification Form
- Completed Type I Guidelines and Checklist (with applicable documentation)
- Additional Permits (if required)

## *Medium Construction Activity (Type II)*

- Type II Application Form
- Completed Type II Guidelines and Checklist (with applicable documentation)
- Comprehensive Stormwater Pollution Prevention Plan (C-SWPPP)
- Stormwater Technical Report
- Construction Plans
- USACE Wetland Jurisdictional Determination
- Additional Permits (if required)

## *Large Construction Activity (Type III)*

- Type III Application Form
- Completed Type III Guidelines and Checklist (with applicable documentation)
- C-SWPPP
- Stormwater Technical Report
- Construction Plans
- Stormwater Masterplan
- Phased EPSC Plan
- USACE Wetland Jurisdictional Determination
- Additional Permits (if required)
- Pre-submittal Meeting is required with TRC

## *Linear/Utility Applications*

- Application for Small Construction Activities and Utility/Linear Projects Form

# Permitting Process: Exemptions and Design Exceptions

- Previously known as Variances
- Exemption: the modification of the minimum stormwater management requirements contained in Chapter 27 of the City of Charleston Ordinance and the Stormwater Management Program for specific circumstances where strict adherence to the requirements would result in unnecessary hardship and not fulfill the intent of Chapter 27 of the City of Charleston Ordinance.
- Requires written request with specific exception sought, supporting data, reasons the exemption should be granted
- If more exemptions are required – additional written requests are required
- For Example: Equalization Pipes and Submerged Systems require an exception
  - Design Requirements SWDSM Section 3.4.6.1.4
  - Exception Procedure SWDSM Section 4.10

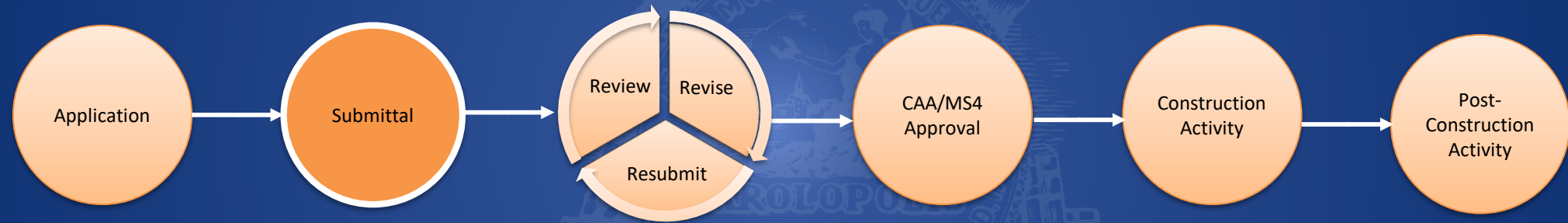
# Permitting Process: Fees

- All fees are paid to the City by the Permittee

Fee	Criteria	Amount
<b>Construction Activity Plan Review<sup>+</sup></b>	Single Family Residential with < 0.5 acres of disturbance	\$100
	All other submittals	\$500 + \$200 per disturbed acre (\$5,000 maximum)
<b>Inspection<sup>**</sup></b>	< 1 acre	\$75
	1 – 5 acres	\$150
	5.01 – 10 acres	\$250
	> 10 acres	\$500
<b>Transfer</b>	Per Property Owner Transaction	\$100

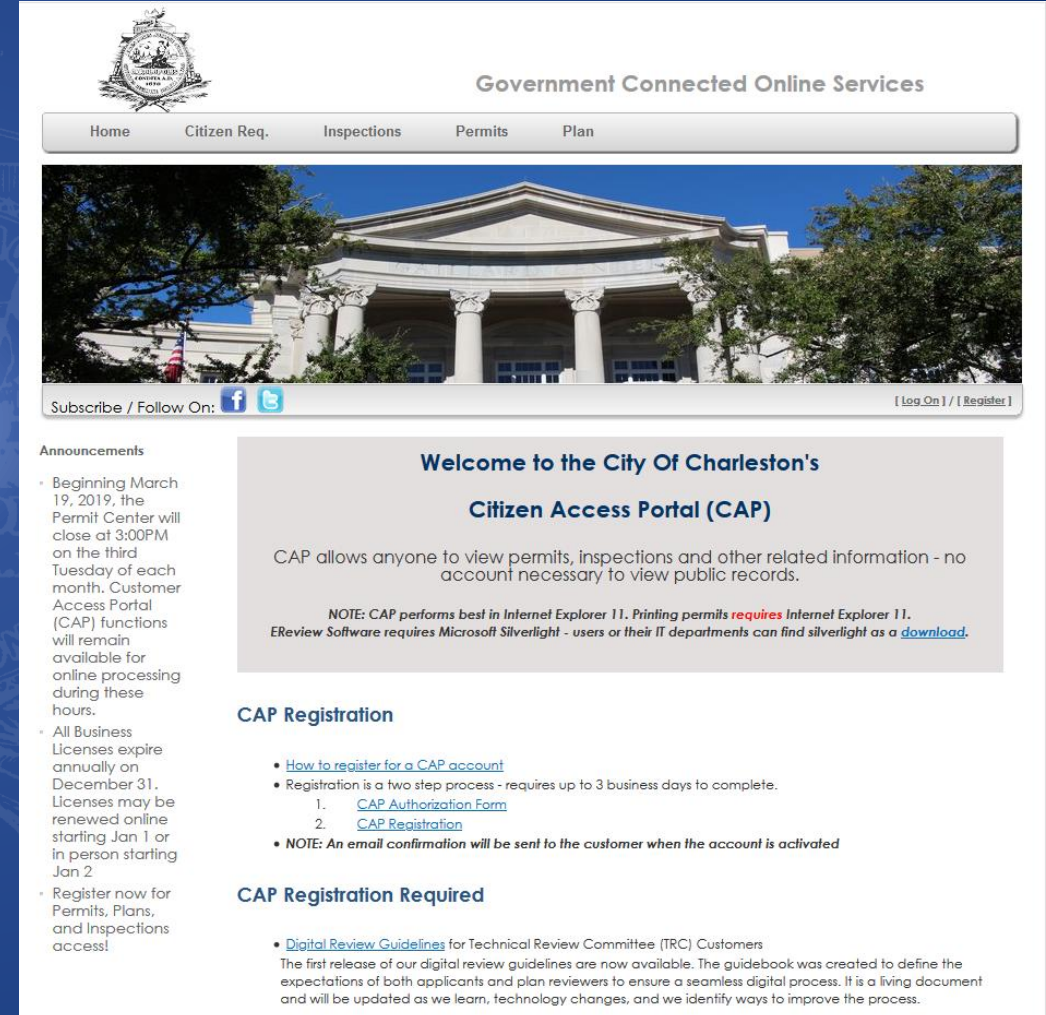
\*Covers the initial inspection and 2 re-inspections

<sup>+</sup>Construction Activity Plan Review and Inspection Fees will increase effective July 1st



# Permitting Process: Citizen Access Portal

- Application packages will be uploaded online and distributed to appropriate departments once CAP is fully implemented
- Comments and Approvals communicated through online portal
- Applicants must be registered
- Website: [https://cap.charleston-sc.gov/energov\\_prod/citizenaccess/site/public/main](https://cap.charleston-sc.gov/energov_prod/citizenaccess/site/public/main)



The screenshot shows the homepage of the City of Charleston's Citizen Access Portal (CAP). At the top, there is a header with the City of Charleston seal and the text "Government Connected Online Services". Below this is a navigation bar with links: Home, Citizen Req., Inspections, Permits, and Plan. A large banner image of the Charleston City Hall is displayed. Below the banner, there are social media links for Facebook and Twitter, and a "Subscribe / Follow On:" button. A "Log On / Register" link is also present. The main content area features a "Welcome to the City Of Charleston's Citizen Access Portal (CAP)" message, stating that CAP allows anyone to view permits, inspections, and other related information without an account. A note mentions that CAP performs best in Internet Explorer 11 and that EReview Software requires Microsoft Silverlight. Below this, there is a "CAP Registration" section with links for "How to register for a CAP account" and a two-step process: 1. CAP Authorization Form, 2. CAP Registration. A note states that an email confirmation will be sent to the customer when the account is activated. Finally, there is a "CAP Registration Required" section with a link for "Digital Review Guidelines" for Technical Review Committee (TRC) Customers, explaining that the first release of digital review guidelines is now available to ensure a seamless digital process.

**Government Connected Online Services**

Home Citizen Req. Inspections Permits Plan

Subscribe / Follow On: [Facebook] [Twitter] [Log On] [Register]

**Announcements**

- Beginning March 19, 2019, the Permit Center will close at 3:00PM on the third Tuesday of each month. Customer Access Portal (CAP) functions will remain available for online processing during these hours.
- All Business Licenses expire annually on December 31. Licenses may be renewed online starting Jan 1 or in person starting Jan 2
- Register now for Permits, Plans, and Inspections access!

**Welcome to the City Of Charleston's Citizen Access Portal (CAP)**

CAP allows anyone to view permits, inspections and other related information - no account necessary to view public records.

**NOTE:** CAP performs best in Internet Explorer 11. Printing permits **requires** Internet Explorer 11. EReview Software requires Microsoft Silverlight - users or their IT departments can find silverlight as a [download](#).

**CAP Registration**

- [How to register for a CAP account](#)
- Registration is a two step process - requires up to 3 business days to complete.
  1. [CAP Authorization Form](#)
  2. [CAP Registration](#)
- **NOTE:** An email confirmation will be sent to the customer when the account is activated

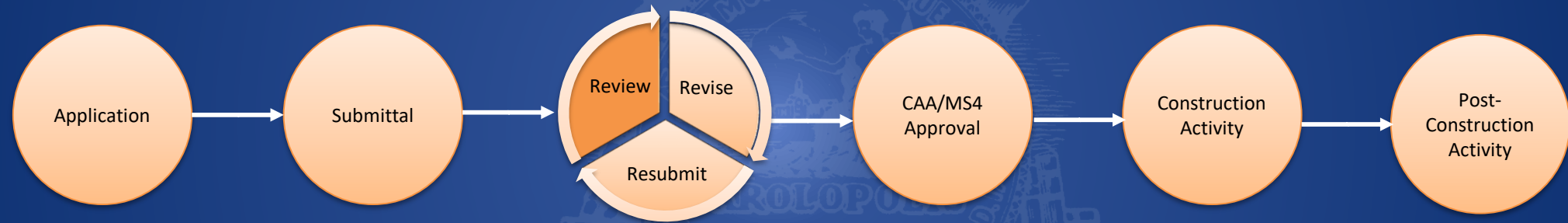
**CAP Registration Required**

- [Digital Review Guidelines](#) for Technical Review Committee (TRC) Customers

The first release of our digital review guidelines are now available. The guidebook was created to define the expectations of both applicants and plan reviewers to ensure a seamless digital process. It is a living document and will be updated as we learn, technology changes, and we identify ways to improve the process.

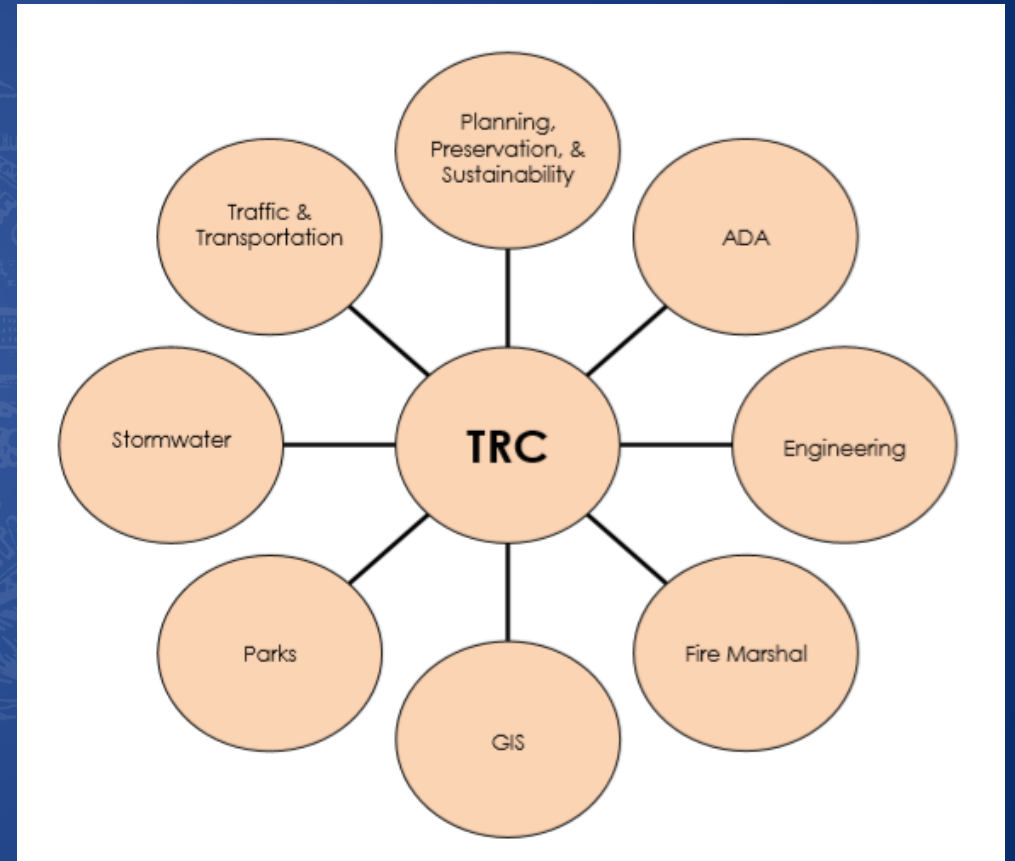
# Permitting Process: TRC & Non-TRC Submittals

- TRC Track Submittal – Route to the Zoning Division
  - Email: Scott Valentine: [valentines@charleston-sc.gov](mailto:valentines@charleston-sc.gov)
  - <https://www.charleston-sc.gov/298/Technical-Review-Committee-TRC>
- Non-TRC Track Submittal – Route to the Department of Stormwater Management
  - Email: Annie Mitchell: [mitchellan@charleston-sc.gov](mailto:mitchellan@charleston-sc.gov)
  - <https://www.charleston-sc.gov/351/Stormwater-Design-Standards-Manual>



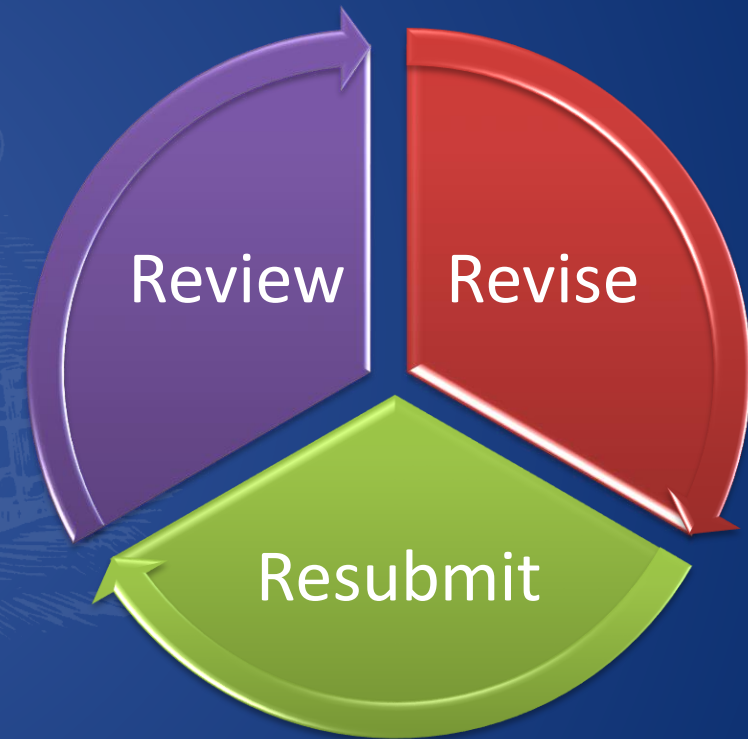
# Permitting Process: Technical Review Committee

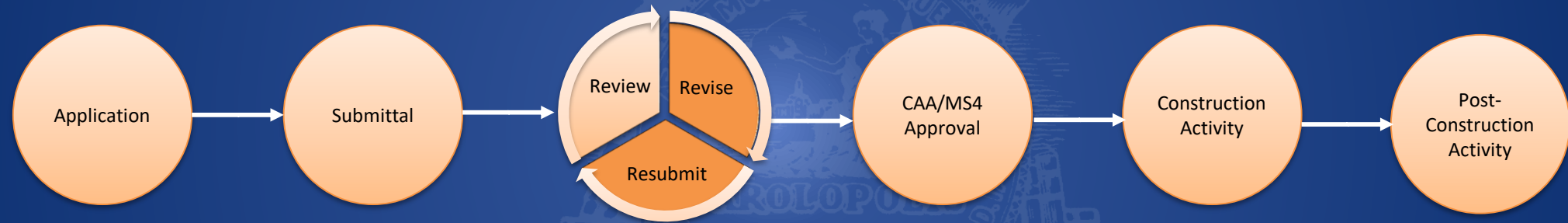
- Reviews Site Plans and Subdivisions for compliance with City codes, regulations, and laws
- Multiple City Departments are involved – beneficial to be well coordinated to avoid confusion and delay



# Permitting Process: Non-TRC Reviews

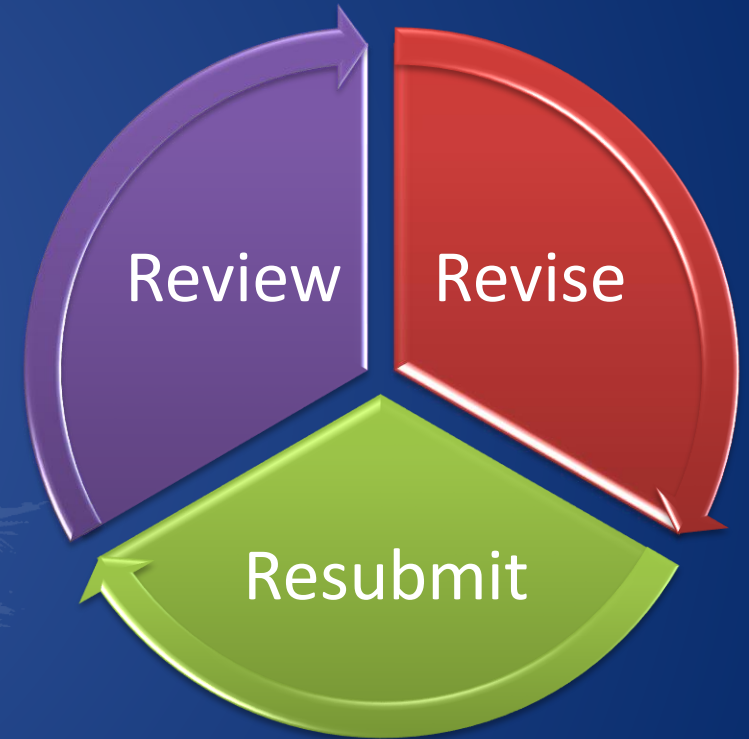
- Non-TRC Review
  - Reviewed by the Department of Stormwater Management, Public Service Department/Engineering Division, and Zoning Division as part of a Construction Activity Application package submittal
  - Typically Linear/Utility Projects

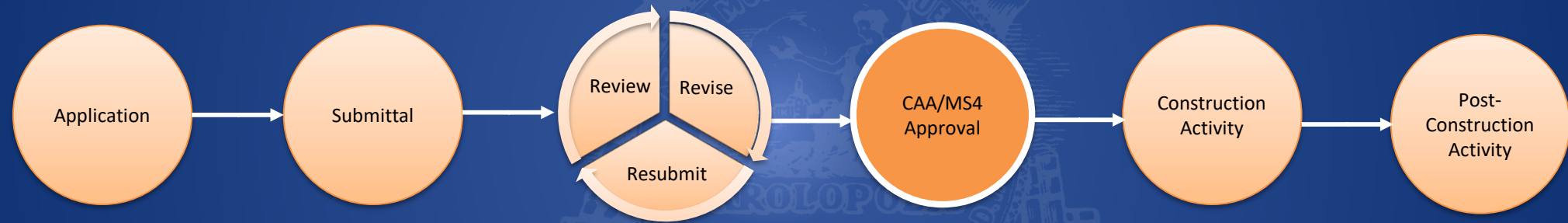




# Permitting Process: Revision/Resubmittal

- Revision and Resubmittal will have to be done for:
  - Review Comments
  - Requests for Additional Information are Required
  - Denial Issued
- City will issue a letter detailing the comments, requests, or reasons for denial
- Applicant will submit response to comments letter
  - If a meeting is required, the meeting must be scheduled and attended prior to submitting the reply letter
- Process will repeat until all comments and requests for needed information have been received by the City



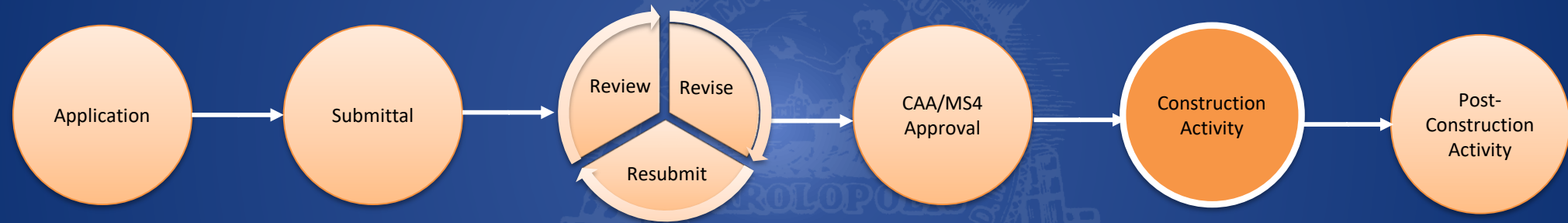


## Permitting Process: Application Approval

- Approval is granted after all requested information is submitted by the applicant
- An CAA/MS4 Approval Letter will be forwarded to the South Carolina Department of Health & Environmental Control (SCDHEC)
- Approval remains valid for five (5) years after issued date.
  - Construction must be initiated within twelve (12) months of issued date or approval will be invalid at the end of the twelfth month.

# Permitting Process: Changes After Approval

- Changes after Approval qualifiers:
  - Revisions made to approved plans and/or construction documents
  - Transferring construction activity responsibility
- Major Modifications/Revisions made to approved design must be submitted to the City in writing
- Revisions include:
  - Pipe size and grade alterations affecting hydraulic capacity
  - Easement boundary changes due to change in stormwater system components
  - Changes in general grading plan that affect flow direction, rate, volume, or quality of runoff



# Construction Activity: Pre-Construction

- Process begins after all Permits are in hand and NPDES coverage has been granted by SCDHEC
- NPDES Pre-Construction Meeting (Section 4.1.C of the Construction General Permit)

Project Type	Requirements	Location
Non-linear	Disturb < 10 acres	May be held off-site
	Disturb ≥ 10 acres	On-site
Linear	Not part of a Larger Common Plan	May be held off-site
	Part of a Larger Common Plan and <10 acres	May be held off-site
	Part of a Larger Common Plan and ≥ 10 acres	On-site

- TRC Pre-Construction Meeting (not required for Non-TRC track)
- After tree protection and initial EPSC BMP installations have been inspected and approved, the City will issue CAA approval and construction can begin

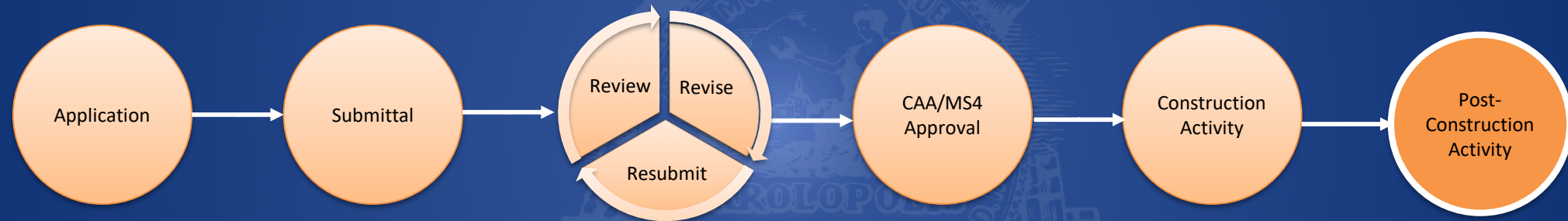
## Construction Activity: Construction

- EPSC BMPs shall be maintained throughout the entirety of construction in accordance with the On-site Stormwater Pollution Prevention Plan (OS-SWPPP)
- Applicant/Owner/Permittee must conduct weekly SWPPP inspections and maintain these records as part of the OS-SWPPP
- Inspections must be conducted at least once every calendar week with no time period between inspections exceeding 9 days
- Final site stabilization and inspection – close-out can begin after City approval

# Construction Activity: Notifications

- The applicant/owner should notify the City based on the occurrence as follows:

Occurrence	Contact	Timeframe
Modifications to the construction sequence or timeframe	Onsite personnel	Immediately
Major modifications to the approved design or SWPPP	City and SCDHEC	Prior to Implementing modification
Transfer of responsibility	City and SCDHEC	14 calendar days
Dangerous spills or leaks	Minor: Onsite personnel Major: Contact 911 or local emergency response team	Immediately
Illicit discharge(s)	City	24 hours
Inspection reports	Personnel responsible for EPSC maintenance	Notify immediately, seven days to perform maintenance
Changes to permit status	Citizen Access Portal	Immediately
City enforcement as described in Section 7.2	Onsite personnel	Immediately



# Post-Construction Activity – Close-Out Package

## Single Family Residential

- Close-Out Application
- Hydrostatic Testing Results (if required)
- Dye Testing Results (if required)

## Site Plan

- Close-Out Application
- SCDHEC Notice of Termination (copy)
- Stormwater Record Drawings\*
- CPMSF Agreement and Fee\*
- Hydrostatic Testing Results (if required)
- Dye Testing Results (if required)
- In Situ Infiltration Testing Results (if required)
- Stormwater Inspection Video (if applicable for public infrastructure)

## Subdivision/Road Construction Projects

- Close-Out Application
- SCDHEC Notice of Termination (copy)
- Stormwater Record Drawings\*
- CPMSF Agreement and Fee\*
- Hydrostatic Testing Results (if required)
- Dye Testing Results (if required)
- In Situ Infiltration Testing Results (if required)
- Stormwater Inspection Video(if applicable for public infrastructure)
- Final Plat

## Linear Projects

- Close-Out Application
- SCDHEC Notice of Termination

\*Required if project has a permanent structural stormwater measure

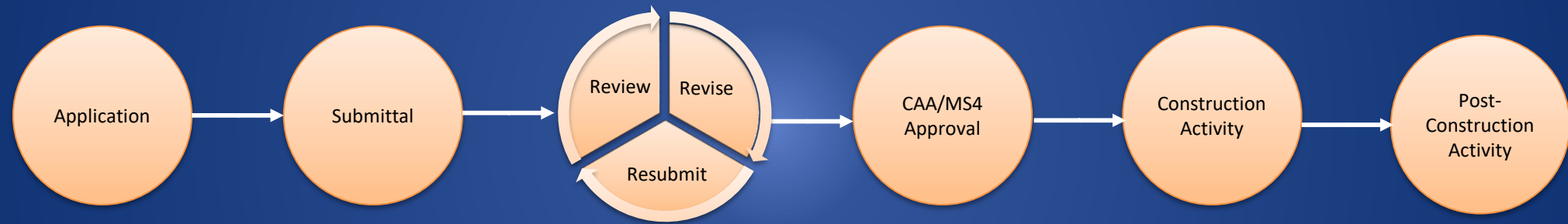
- Hydrostatic testing may be required when stormwater infrastructure will be conveyed to the City. Does not apply for Site Plan projects, unless a public utility is located within an easement
- Dye Testing is required for any new sanitary sewer connection
- In Situ testing is required for any infiltration BMP
- City of Charleston Dedication Manual [https://www.charleston-sc.gov/DocumentCenter/View/14638/2017-Dedication-Manual-Final\\_031517?bidId=](https://www.charleston-sc.gov/DocumentCenter/View/14638/2017-Dedication-Manual-Final_031517?bidId=)

## Post-Construction Activity

- A package is “Administratively Complete” upon receipt of all required documentation based on Construction Activity Type
- City will review and comment
- Once comments have been addressed, the City will issue a CAA Closeout Approval Letter
- Construction Process is complete after letter is received along with approval of Notice of Termination from SCDHEC

# Warranty

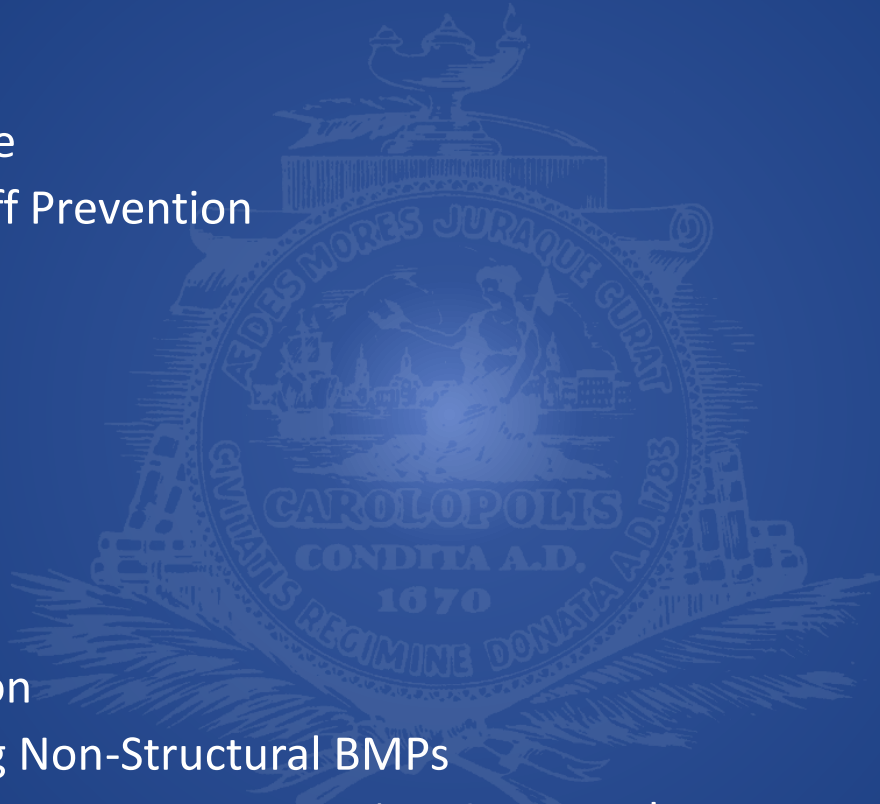
- A 2-year warranted of the installed stormwater system shall be signed by the owner and submitted to the City
- City must accept the warranty before any type of Certificates of Occupancy are issued to the owner/permittee
- Any deficiencies, defects, or failures that occur during the 2-year time period will be addressed by the owner/permittee
  - City is to be notified
  - Subsequent inspection will be required after issues are addressed
- Prior to the end of the warranty period, City will inspect the stormwater facilities
  - Any deficiencies will be addressed by the owner/permittee
  - Subsequent inspection will be required after issues are addressed
- Pipes will be video inspected at the end of the 2-year time period and be subject to the same requirements at the initial inspection video



# Conceptual Planning for Stormwater and Low Impact Development

*Educational Memorandum #2*

- Principles of LID
  - Working with the Landscape
  - Focus on Stormwater Runoff Prevention
  - Micromanage Stormwater
  - Keep it Simple
  - Practice Multi-tasking
  - Maintain and Sustain
- Conceptual Site Planning
  - Early Site Recognition
  - Inventory and Site Evaluation
  - Initial Concept Design Using Non-Structural BMPs
  - Preliminary Site Plan Development Incorporating Structural BMPs
  - Maintenance



# Principles of LID: Working with the Landscape

- Integrates existing and natural systems as the framework for site planning
- Identifies environmentally sensitive areas and local features
- Outlines the development envelope
- Reduces the amount of hard stormwater infrastructure
- May reduce stormwater management costs

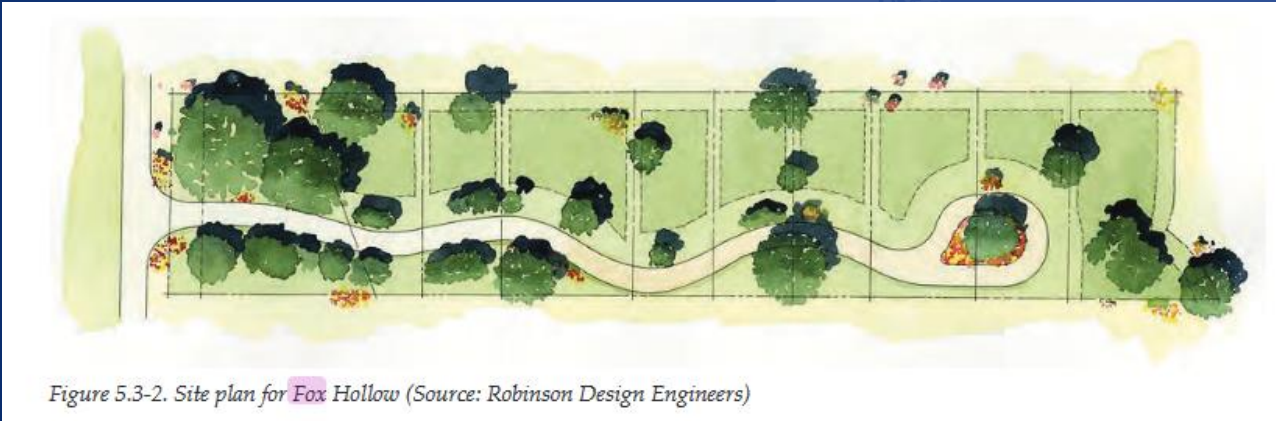


Figure 5.3-2. Site plan for Fox Hollow (Source: Robinson Design Engineers)

*“At Fox Hollow, the developer (New Leaf Builders) wanted to create a low impact development that protected the trees, wetlands, and topography of the site. Unlike conventional development, where mass grading is common, at Fox Hollow the land has been highly conserved – only enough land for the houses and roadway were cleared. Narrow streets and driveways reduce impervious cover in the development. Rather than relying on pipes, a bioswale system conveys stormwater. Bioretention cells replace stormwater ponds.”*

# Principles of LID: Focus on Stormwater Runoff Prevention

- Minimized by reducing road widths and parking areas, using shared driveways, and disconnecting impervious surfaces
- Clearing and regrading can be minimized by clustering and reducing building footprint
- Reduce runoff at the source by employing techniques like green roofs that can store and evaporate rainfall before it reaches the existing ground/grade



Source of Pictures: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)

# Principles of LID: Micromanage Stormwater

- Manage stormwater where it falls instead of conveying long distances
- Create many small watersheds that can manage stormwater through a series of LID features and Post-construction BMPs
- Maximizes sheet flow causing little to no runoff for low-intensity storms



Concept plan for Laurel Oak Grove (provided by Seamon Whiteside + Associates)

Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)

# Principles of LID: Keep It Simple

- Emphasize simple
- Nonstructural, low-tech, and low cost methods are the goal
- Example methods:
  - Open drainage systems
  - Filter strips
  - Disconnection of roof runoff
  - Rain barrel/cistern
  - Public education (e.g., signage)
  - Minimize disturbed areas



*Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)*

# Principles of LID: Practice Multi-tasking



Figure 4.2-3. Bioretention in a Residential Setting (Photo: NEMO)

Source of Pictures: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)



Figure 3.3-9. LID landscaping incorporating stormwater treatment and native vegetation (Photo: Kathryn Ellis)

- Design and create multi-functional landscape that provide stormwater management benefits:
  - Filtration
  - Treatment
  - Infiltration
- Ancillary benefits of LID – wildlife habitat and reduced heat island effects

# Principles of LID: Maintain and Sustain

- Incorporate native plants that are resistant to extreme conditions (wet and dry), low maintenance, have a deeper root system that promotes infiltration
- Plant selection should reduce the use of pesticides, herbicides, and fertilizers
- Lower maintenance designs are likely to be maintained and result in improved water quality



Sarah White, Clemson University

## Wildlife Interactions

Attracts Butterflies, Attracts Birds, Attracts Hummingbirds, Deer Resistant

## Stormwater Practice

Rain Garden, Swale, Shoreline Buffer, Floating Wetland, Constructed Wetland

## Comments

This iris has wonderfully textured, light-green foliage with lavender-blue flowers 4 inches across in the spring. 💎

## Blue Flag, Blue Flag Iris

*Iris virginica*

Type	Perennial, Ground Cover
Region	Coast
SC Native	Yes
Light Needs	Part Sun
Soil Texture	Sand, Clay, Loam
Soil pH	Acidic, Slightly Acidic, Slightly Alkaline
Soil Moisture	Medium-Drained, Poorly-Drained
Drought Tolerance	Medium
Salt Tolerance	Low
Growth Rate	Medium
Mature Height	4 to 7 feet
Mature Spread	1 to 3 feet

Source of Pictures: Carolina Yards Plant Database (Clemson University; Clemson Cooperative Extension)

# Conceptual Site Planning: Early Site Recognition

- Developer should assess property ***BEFORE*** a site is bought for investment return feasibility
- May consult with the City about a property to discuss specific permits, requirements, and potential obstacles that may come up in development



Figure 5.7-2. Jarvis Creek Park conceptual drawing (Source: Town of Hilton Head)

Picture Source: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)

# Conceptual Site Planning: Inventory & Site Evaluation

- Review Ordinances from all applicable City Departments (TRC Process)
- Locate environmentally sensitive resources: wetlands, mature trees, slopes, drainageways, permeable soils, waterway buffers
- **CONSIDER LID IMPLEMENTATION**
- Assess existing hydrology and soil characteristics on a watershed level
  - Determine if site is in an Special Protection Area
  - Determine if site drains to Impaired Waters
  - Evaluate downstream flooding potential or run-on issues from neighboring properties
  - Assess planned future development in the area
  - Erodibility of the soil
  - Steepness of slopes

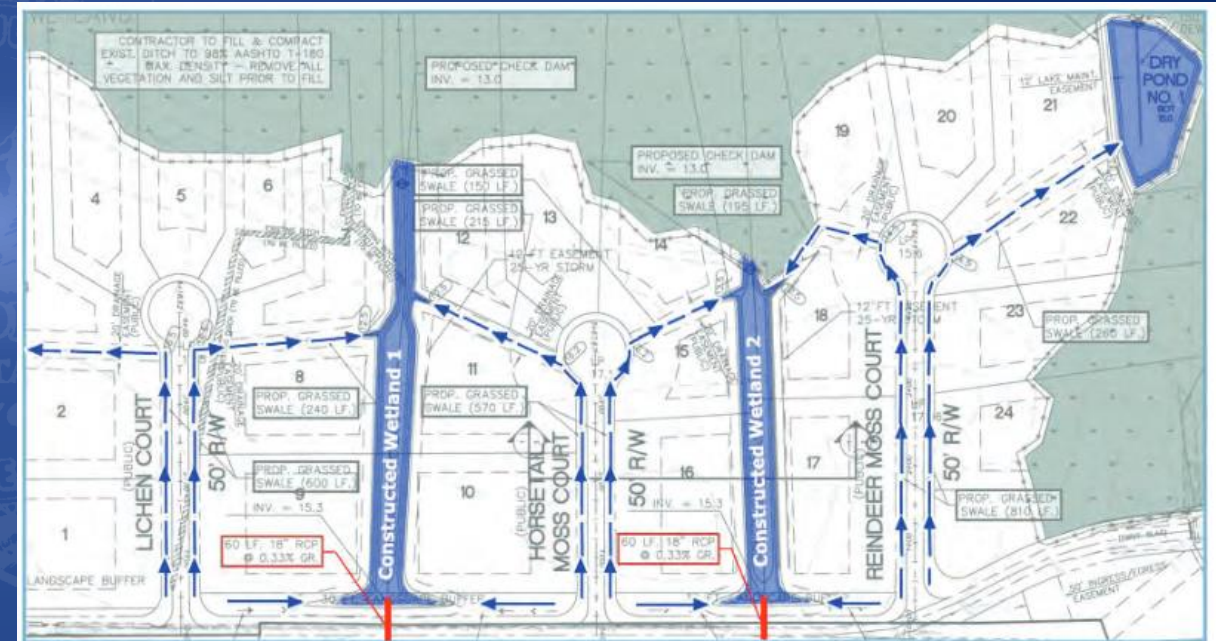


Figure 5.8-2. Plans for Moss Park constructed wetlands (courtesy of The EARTHWORKS Group)

*Picture Source: Low Impact Development in Coastal South Carolina: A Planning and Design Guide (Ellis et al, 2014)*

# Conceptual Site Planning: Inventory & Site Evaluation

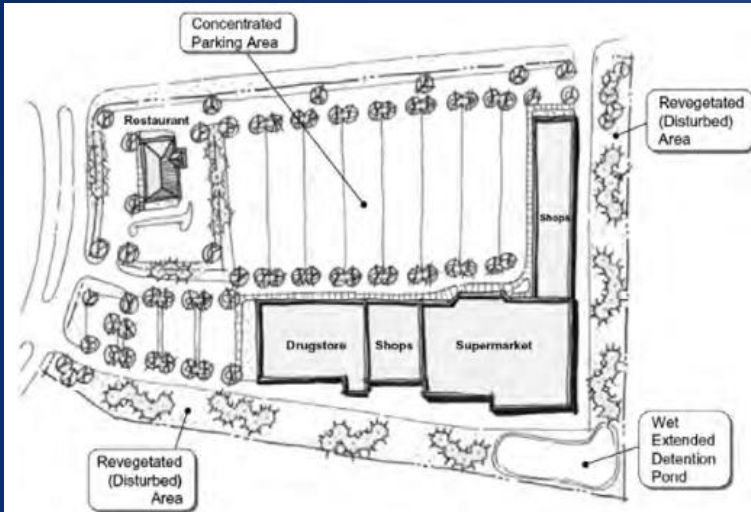


Figure 3.3-7. Conventional Parking Lot Layout (RI DEM, 2011)  
Conventional parking designs clear the entire site, that later needs to be revegetated, and creates one massive area for parking.

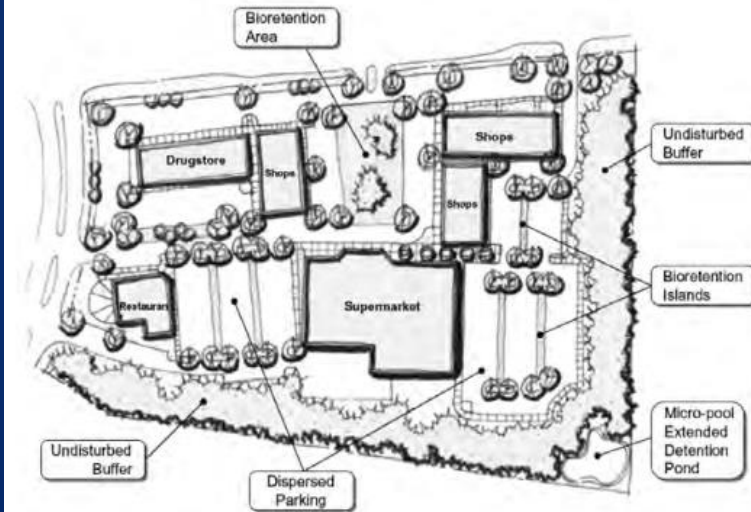


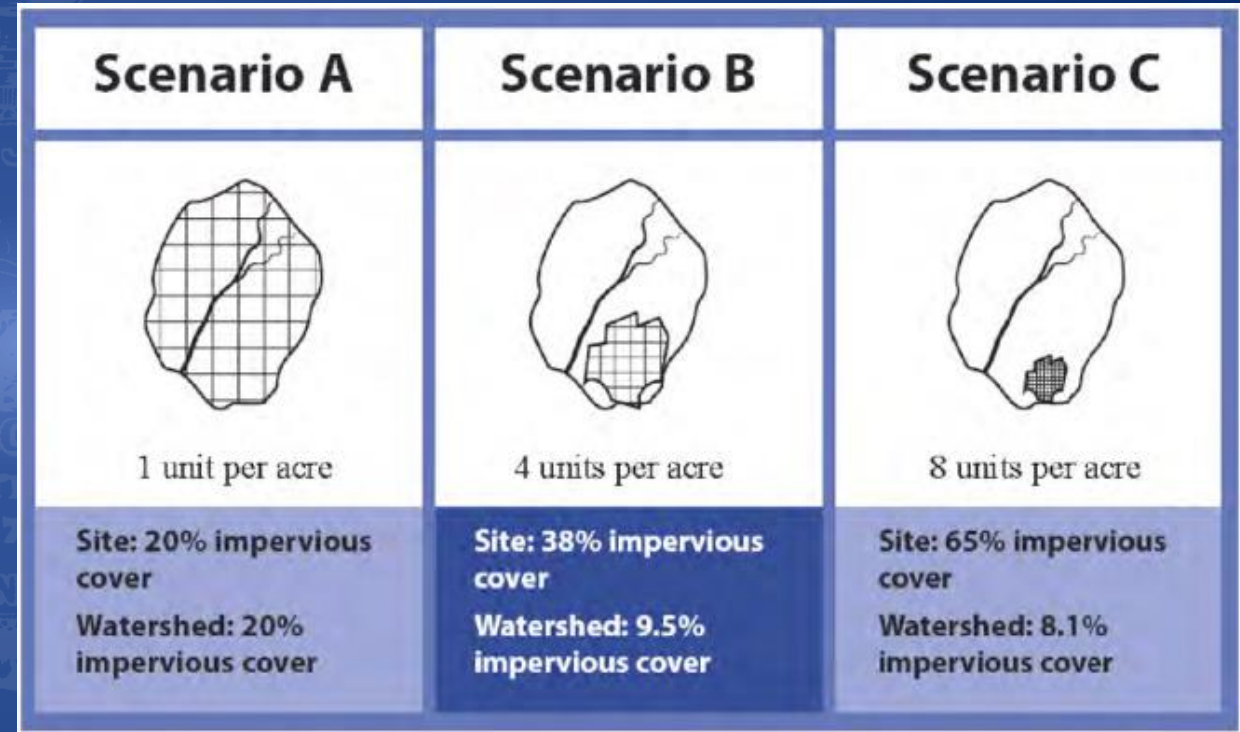
Figure 3.3-8. Parking Lot Layout Using LID Techniques (RI DEM, 2011)  
The LID design leaves undisturbed buffers of native vegetation, incorporates landscaped islands that treat stormwater, and disperses the parking into smaller areas.

- Assess existing hydrology on a site-specific level
  - Hydrological functions of the site: surface water, groundwater, and tidal influence
  - Natural resource locations
  - Geotechnical evaluation: soils for potential infiltration and water table depth
  - Effect of project size and shape on stormwater management
  - Determine areas best suited for development and those that should be avoided
  - Determine if areas exist where LID infiltration practices should be avoided due to historical land use and contamination

Picture Source: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)

# Conceptual Site Planning: Initial Concept Design Using Non-structural BMPs

- Develop initial concept plan based on information gathered during the Inventory & Site Evaluation process
- Incorporate non-structural best management practices (BMPs) Woodland and wetland protection
  - Clustering
  - Minimizing and disconnecting impervious surfaces
  - BMPs from the *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)



Picture Source: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)

<http://www.northinlet.sc.edu/wp-content/uploads/2019/12/LID-in-Coastal-SC.pdf>

# Conceptual Site Planning: Preliminary Site Plan Development

## Incorporating Structural BMPs

- Define development envelope/locate potential site
  - Cluster buildings and reduce building footprints to minimize clearing/grading
  - Determine possible LID BMPs for the site
  - Keep open space and wildlife habitat
  - Create small watersheds to route stormwater to a LID BMP
    - Use BMPs that promote filtration, treatment, and infiltration components
    - Use green rooftops and disconnection from rooftop to impervious areas
  - Maintain natural flow paths and use open drainage
  - Flatten slopes as much as possible to lengthen sheet flow
  - Reduce road widths
  - Use shared driveways/reduced parking areas with permeable paving
  - Align roads along grades
  - Minimize high maintenance lawn areas
- Draw the lot lines (for Residential Developments)



Picture Source: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)

# Conceptual Site Planning: Maintenance

- Depending on the BMP, maintenance can be low cost or rolled into the landscaping budget
  - If rolled into the landscaping budget, landscapers will need to be educated what and where the BMPs are located to avoid accidental damage or creation of obstacles (e.g., filling in a bioretention cell, installation of trim guards around any BMP)
- Maintenance schedules can be found in the *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Ellis et al, 2014)
- If responsibility is transferred to an HOA, LIDs are typically more affordable and easily accessible to maintain since BMPs are smaller

Best Management Practice	Maintenance Cost
Wet Pond	\$4,411
Wetland	\$752
Bioretention Cell	\$583

Source: *Low Impact Development in Coastal South Carolina: A Planning and Design Guide* (Table 1.2-5) (Ellis et al., 2014)

Note: Estimates are for a 10-acre watershed with a CN = 80.

# Technical Q&A

